What is Claimed is:

1. A method for processing a substrate, comprising:

positioning a substrate having a conductive material formed thereon in a polishing apparatus having one or more rotational carrier heads and one or more rotatable platens, wherein the carrier head comprises a retaining ring and a membrane for securing a substrate in the carrier head and the platen has a polishing article disposed thereon;

contacting the substrate surface with the polishing article at a ratio of retaining ring contact pressure to membrane pressure of greater than about 1.1:1; and

polishing the substrate to remove conductive material from the substrate.

2. The method of claim 1, wherein the retaining ring contact pressure is between about 0.4 psi and about 7.5 psi greater than a membrane pressure.

3. The method of claim 2, wherein the retaining ring contact pressure is between about 11 psi or less and the membrane pressure is about 5 psi or less.

4. The method of claim 2, wherein the ratio of retaining ring contact pressure to membrane pressure is greater than about 1.1:1 and less than about 5.5:1.

5. The method of claim 2, wherein the retaining ring contact pressure is between about 2 psi and about 7.5 psi greater than a membrane pressure, the retaining ring contact pressure is between about 2 psi and about 11 psi, the membrane pressure is about 5 psi or less, and the ratio of retaining ring contact pressure to membrane pressure is greater than about 1.1:1 and less than or equal to about 5.5:1.

6. The method of claim 1, wherein polishing the substrate comprises polishing the substrate at a ratio of carrier head rotational speed to platen rotational speed of between about 1:1 and about 12:1.

7. The method of claim 6, wherein the platen rotational speed and a carrier head rotational speed provide a second relative linear velocity between about 20 mm/second and about 1675 mm/second at the center of the substrate.

8. The method of claim 7, wherein the carrier head has a carrier head rotational speed between about 10 rpm and about 120 rpms, the platen has a platen rotational speed between about 10 rpm and about 40 rpms, and the platen rotational speed and the carrier head rotational speed are accelerated at a rate between about 5 rpms/second and about 30 rpms/second.

9. The method of claim 1, wherein polishing the substrate comprises polishing the substrate at a first polishing pressure and a first platen rotational speed and then polishing the substrate at a second polishing pressure less than the first polishing pressure and a second platen rotational speed less than the first platen rotational speed.

10. The method of claim 10, wherein the first polishing pressure is about 3 psi or greater and the second polishing pressure is about 2 psi or less.

11. The method of claim 10, wherein the first platen rotational speed and a first carrier head rotational speed provide a first relative linear velocity between about 600 mm/second and about 1675 mm/second at the center of the substrate and the second platen rotational speed and a second carrier head rotational speed provide a second relative linear velocity between about 20 mm/second and about 550 mm/second at the center of the substrate.

12. The method of claim 1, wherein the polishing article comprises a solid, pattern-free, abrasive-free polishing pad.

13. The method of claim 1, further comprising polishing the substrate on a second platen to remove a barrier layer material disposed under the conductive material.

14. The method of claim 13, further comprising buffing the substrate on a third platen.

15. A method for processing a substrate, comprising:

positioning a substrate comprising copper features formed in a low k dielectric layer and a tantalum containing material disposed therebetween, in a polishing apparatus having one or more rotational carrier heads and one or more rotatable platens, wherein the carrier head comprises a retaining ring and a membrane for securing the substrate in the carrier head and the platen has a polishing article disposed thereon;

contacting the substrate surface and the polishing article to each other at a retaining ring contact pressure of about 0.4 psi or greater than a membrane pressure at a ratio of retaining ring contact pressure to membrane pressure greater than about 1.1:1 and less than or equal to about 5.5:1;

polishing the substrate at a first relative linear velocity of about 600 mm/second or greater at the center of the substrate; and

polishing the substrate at a second relative linear velocity of less than about 600 mm/second or less at the center of the substrate, wherein the carrier head rotational speed is greater than the platen rotational speed by a ratio of carrier head rotational speed to platen rotational speed of greater than about 1:1.

16. The method of claim 15, wherein the second relative linear velocity is produced at a platen rotational speed between about 10 rpm and about 40 rpm and a carrier head rotational speed between about 20 rpm and about 120 rpms.

17. The method of claim 16, further comprising accelerating the platen rotational speed and the carrier head rotational speed at a rate between about 5 rpms/second and about 30 rpms/second.

18. The method of claim 15, wherein the retaining ring contact pressure is about 11 psi or less and the membrane pressure is about 5 psi or less.

19. The method of claim 18, wherein the retaining ring contact pressure is between about 3 psi and about 6 psi greater than a membrane pressure and the ratio of retaining ring contact pressure to membrane pressure is between about 2:1 and about 3.5:1.

20. The method of claim 15, wherein the polishing article comprises a solid, pattern-free, abrasive-free polishing pad.

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21. A method for processing a substrate, comprising:

positioning a substrate having a conductive material formed thereon in a polishing apparatus having one or more rotational carrier heads and one or more rotatable platens, wherein the carrier head comprises a retaining ring and a membrane for securing a substrate in the carrier head and the platen has a polishing article disposed thereon;

polishing the substrate at a first polishing pressure and a first platen rotational speed with a first retaining ring contact pressure between about 0.4 psi or greater than a first membrane pressure and at a first ratio of retaining ring contact pressure to membrane pressure of greater than about 1.1:1; and

polishing the substrate at a second polishing pressure less than the first polishing pressure and a second platen rotational speed less than the first platen rotational speed at a ratio of a second carrier head rotational speed to second platen rotational speed of greater than about 1:1 with a second retaining ring contact pressure about 0.4 psi or greater than a second membrane pressure and at a second ratio of second retaining ring contact pressure to second membrane pressure of greater than about 1.1:1.

22. The method of claim 21, wherein the first and second retaining ring contact pressures are about 11 psi or less and the first and second membrane pressures are about 5 psi or less.

23. The method of claim 21, wherein the ratio of the second retaining ring contact pressure to the second membrane pressure is greater than about 1.1:1 and less than or equal to about 5.5:1.

24. The method of claim 21, wherein polishing the substrate comprises polishing the substrate at a ratio of carrier head rotational speed to platen rotational speed of between about 10:1 or greater.

25. The method of claim 21, wherein the first platen rotational speed and a first carrier head rotational speed provide a first relative linear velocity between about 600 mm/second and about 1675 mm/second at the center of the substrate and the second platen rotational speed and the second carrier head rotational speed provide a second relative linear velocity between about 20 mm/second and about 550 mm/second at the center of the substrate.

26. The method of claim 21, wherein the polishing article comprises a solid, pattern-free, abrasive-free polishing pad.

27. The method of claim 21, wherein the first polishing pressure is about 3 psi or grater and the second polishing pressure is about 2 psi or less.

28. The method of claim 21, wherein the conductive material is formed in a low k dielectric material feature definitions and the first polishing pressure is about 1.5 psi or greater and the second polishing pressure is about 1 psi or less.

29. A method for processing a substrate, comprising:

providing a substrate having a conductive material disposed thereon to a polishing apparatus;

polishing the substrate at a first relative linear velocity between about 600 mm/second and about 1675 mm/second at the center of the substrate; and

polishing the substrate at a second relative linear velocity between about 20 mm/second and about 600 mm/second at the center of the substrate.

30. The method of claim 29, wherein the first relative linear velocity is between about 1000 mm/second and about 1200 mm/second at the center of the substrate and the second relative linear velocity is between about 20 mm/second and about 400 mm/second at the center of the substrate.

31. The method of claim 29, wherein the conductive material comprises copper, doped copper, copper alloys, or combinations thereof.

32. The method of claim 29, wherein the second linear velocity is provided by a platen rotational speed between about 10 rpms and about 40 rpms and a carrier head rotational speed between about 20 rpms and about 120 rpms, wherein the carrier head rotational speed is greater than the platen rotational speed by a ratio of carrier head rotational speed to platen rotational speed of between about 2:1 and about 3:1 to remove residual copper material.

33. An apparatus for processing a substrate comprising:

one or more platens adapted for polishing a substrate; and

a computer based controller configured to cause the system to perform a method comprising:

polishing the substrate at a first relative linear velocity between about 600 mm/second and about 1675 mm/second at the center of the substrate; and

polishing the substrate at a second relative linear velocity between about 20 mm/second and about 600 mm/second at the center of the substrate.

34. The apparatus of claim 33, wherein the system further comprises one or more rotational carrier heads and one or more rotatable platens, wherein the carrier head comprises a retaining ring and a membrane for securing a substrate in the carrier head and the platen has a polishing article disposed thereon, and the system is further configured to polish the substrate at a ratio of retaining ring contact pressure to membrane pressure of greater than about 1.1:1, a retaining ring contact pressure of about 0.4 psi or greater than a membrane pressure, or combinations thereof.

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